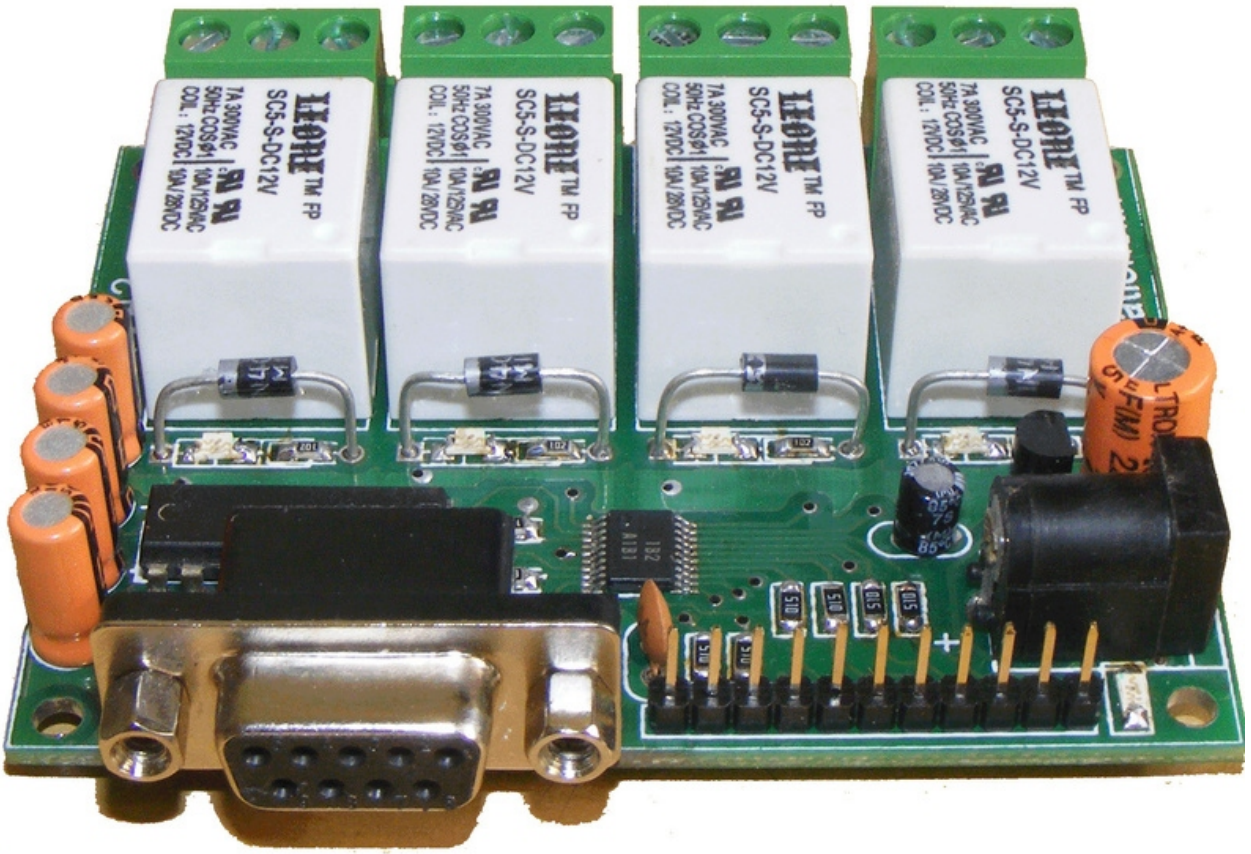
User Manual


LIEORE TM FP
SC5-S-DC12V
7A 300VAC
50Hz COSΦ1
10A/125VAC
COIL: 12VDC
10A/28VDC

4 channel RS232 Relay Board with 9 Digitlal/Analog I/O Rs232 Data Acquisition Card

Welcome to the world of Computer Automation. This RS232 Relay Board - R242 is a perfect companion for all your computer automation projects. It is RS232 based card having 4 onboard relays for switching external devices and upto 9 digital & analogue I/Os that will help you to monitor various real world scenarios using switches & different kind of sensors to monitor many parameters like Temperature, Pressure, Light, Touch, PH etc. This card is not only good for controlling Relays but a perfect example for Data Acquisition applications.

It uses existing Com Port (you can choose the available one), which allows easy communication with the card. Any programming language that supports serial communications (C, C#, C++, VB, VB.NET, Perl, Java etc) can be used to communicate with R242 very easily. Easy to use commands are available to communicate with R242 which handle various tasks like Switching On/Off of Relays, Controlling Digital Inputs & Outputs, Getting analog data etc.

The controller provides 4 relay outputs to control various electrical devices. Apart from this, the card has up to 9 digital input & output pins. It has also got 4 Analog input pins. All pins can be individually configured as Digital Input or Digital output on the fly. All analog pins can be individually configured as digital I/Os also while taking care of input conditions.

Each Digital pin can support a TTL or Schmitt Trigger Input or a 5V output. Each Analog pin will convert analog voltage (Between 0 to 5V) or Higher (through voltage divider) into 10 bit resolution raw data. This can be converted into required form using conversion formulas.

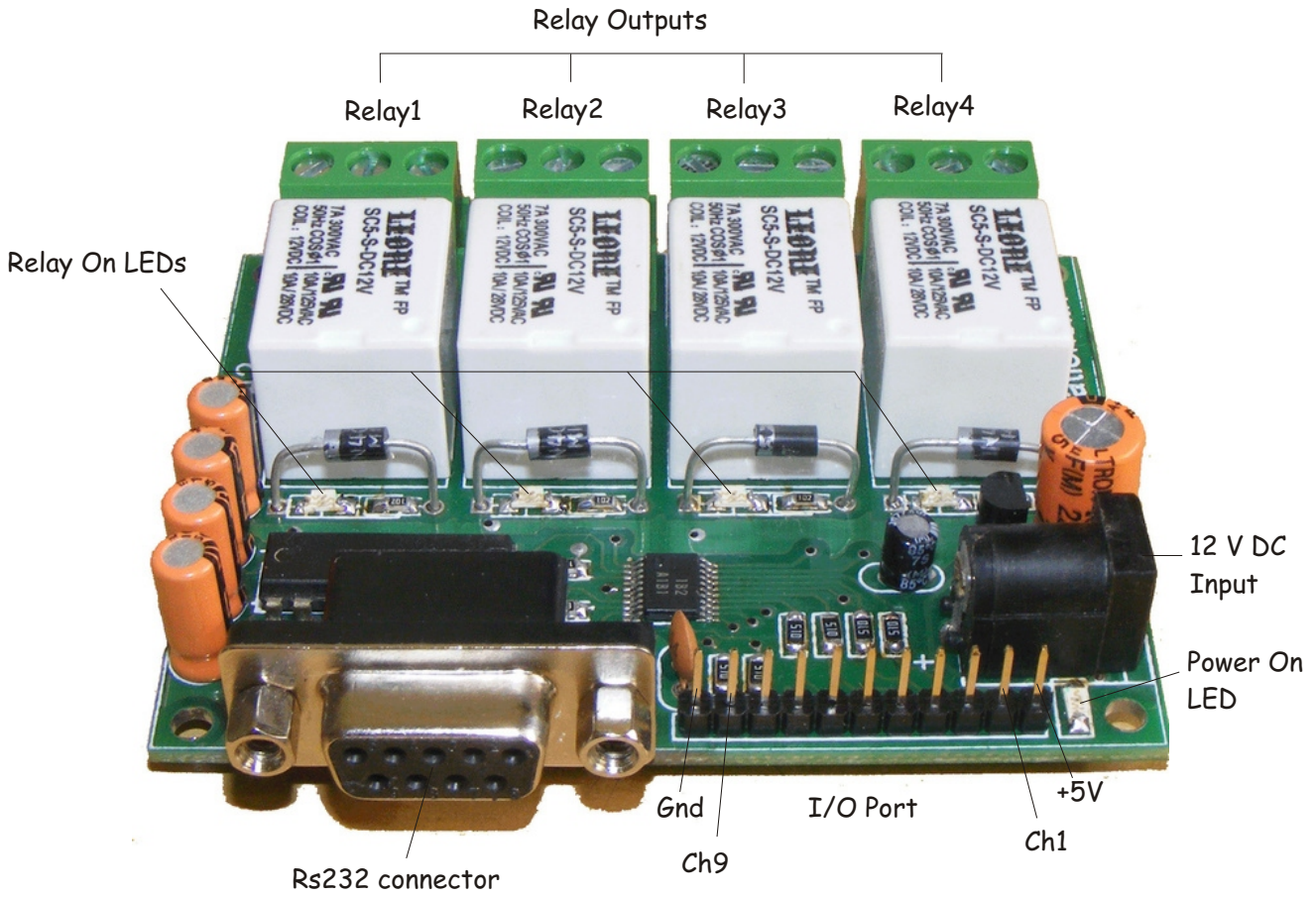
Any kind of sensor wether it is providing digital output or analogue output can be interfaced with R242 and monitored with the help of computer.

Get windows drivers, test applications and sample codes at -

http://iknowvations.in

Manufactured by -

Iknowvations
Rajivnagar,Vidyanagar
Hubli - 580021
India.



Technical Specifications -

No. Of Relays	-	4.
Relay Specifications	-	Coil Voltage 12V Dc. Contact capacity - 5A Max.
Digital Inputs	-	Up to 9.
Analog Inputs	-	Up to 4.
Supply voltage	-	12 V Dc.
Analog In Volts	-	0-5V Dc.
ADC Resolution	-	10 bits.

Please Read Carefully

This device R242 connects to RS232 port of your computer and can be used to control external devices through its relays. Incorrect use or faulty board can cause damage to controller itself or Serial Port controller of your computer or Motherboard of your computer. **Extreme care should be taken while using this board. It will be totally user's responsibility for the use of this card.**

Iknowvations, it's employees, suppliers, distributors, dealers and/or resellers are not liable to any kind of damage or loss of data as a result of use of this device, including special, incidental, or consequential damages resulting from the use of this device or under any legal theory, including loss of profits, downtime, goodwill damage to, or replacement of equipment or property and any cost for recovering or reproducing any data stored in computers connected with this device.

Your purchase and/or use of this board indicates your acceptance of these terms.

Command Reference -

1. For Digital Outputs - SO10 - Set Output of Channel 1 to 0.
SO11 - Set Output of Channel 1 to 1.
There are up to 7 digital Output channels on this card so it will be up to SO70 & SO71.

2. For Digital Inputs - GI01 - Get Input value of Channel 01.
GI02 - Get Input value of Channel 02.
There are up to 9 digital Inputs channels on this card so it will be up to GI09.

3. For Analog Inputs - ADC1 - Get ADC value of Channel 1.
ADC2 - Get ADC value of Channel 2.
There are up to 4 Analog channels on this card so it will be up to ADC4. The resolution is of 10 bits so the input voltage (0-5V Dc) will be converted to 0 to 1023 Decimal value.

4. For Relay Outputs - RL10 - Make Relay 1 Off.
Rl11 - Make Relay 1 On.
There are 4 Relays on this card so it will be up to RL40 & Rl41. There are 2 additional commands for relays -
RLA0 - Make All Relays Off.
RLA1 - Make All Relays On.

5. Setting I/O channels- I1XX - XX in Hex

1000 0000 -	bit7	bit6	bit5	bit4	bit3	bit2	bit1	bit0
	1	Ch7	Ch6	Ch5	Ch4	Ch3	Ch2	Ch1

1- for pin to be output, 0- for pin to be input

6. Miscellaneous Commands -
BORD - Issuing this command will return the card Number.
VERS - Issuing this command will return the Firmware Version Number.
GTI1 - Get Set value of I/O channels.

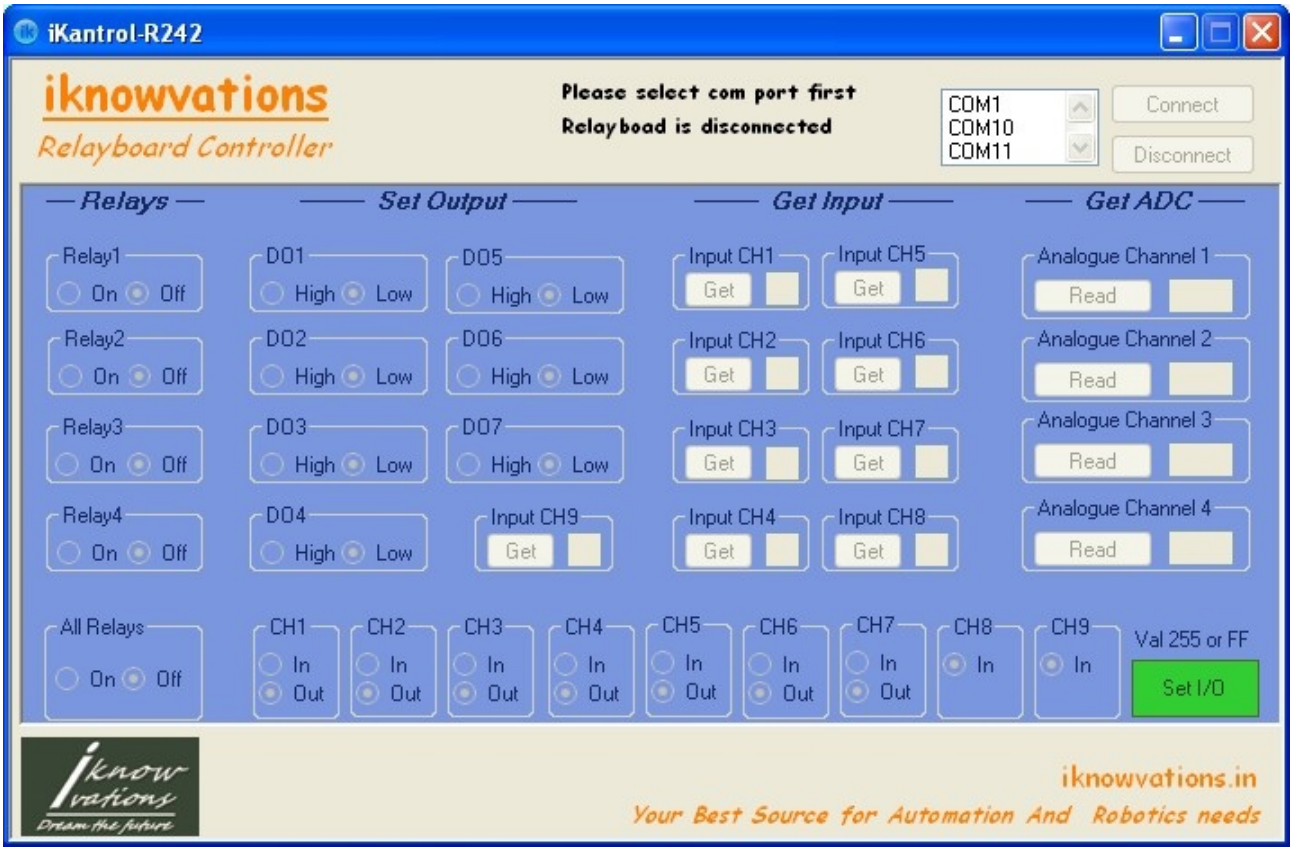
Channel 1 - CH1 - Input / Output / ADC 1
Channel 2 - CH2 - Input / Output / ADC2
Channel 3 - CH3 - Input / Output / ADC3
Channel 4 - CH4 - Input / Output / ADC4
Channel 5 - CH5 - Input / Output
Channel 6 - CH6 - Input / Output
Channel 7 - CH7 - Input / Output
Channel 8 - CH8 - Input only
Channel 9 - CH9 - Input only

Please note that all the input channels have weak pull up enabled all the time and after first time connection of card the channel setting will be FF that is all channels will be outputs. All the output pins will be 0 that is will be low at this time.

Using the card - R242-

You can connect the card with your computer using any serial port cable. You have also to apply power 12 V Dc to Barrel connector (center +ve).
You can communicate with the card through Hyper Terminal Software which generally every computer has pre installed or you can use iKantrol-R242 - a special software made by Iknowvations (you can download it free from our website iknowvations.in) or you can develop your own software.

Now let us see how we can communicate with R242 with the help of iKantrol-242.
Connect R242 card with Rs232 cable & power it.
Start iKantrol-R242.
You will get following screen on your computer.



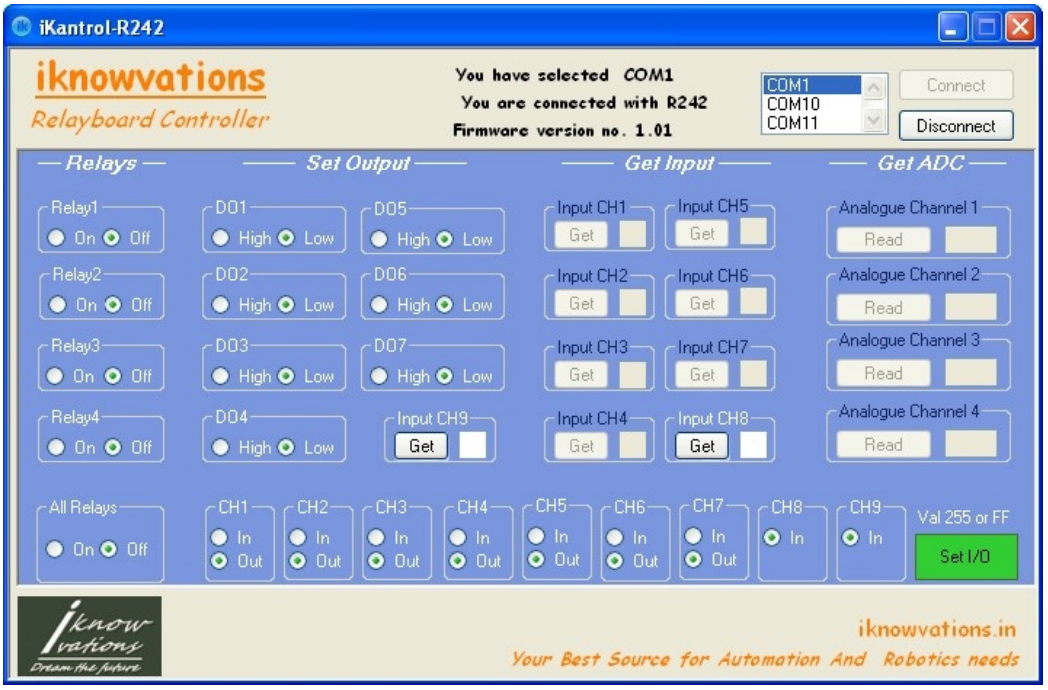
Select the com port to which you have connected the card R242 from available com port list. Press connect button. If the card is connected you will get next screen with all the buttons enabled in blue panel.

If card is not connected or powered up you will get following message -

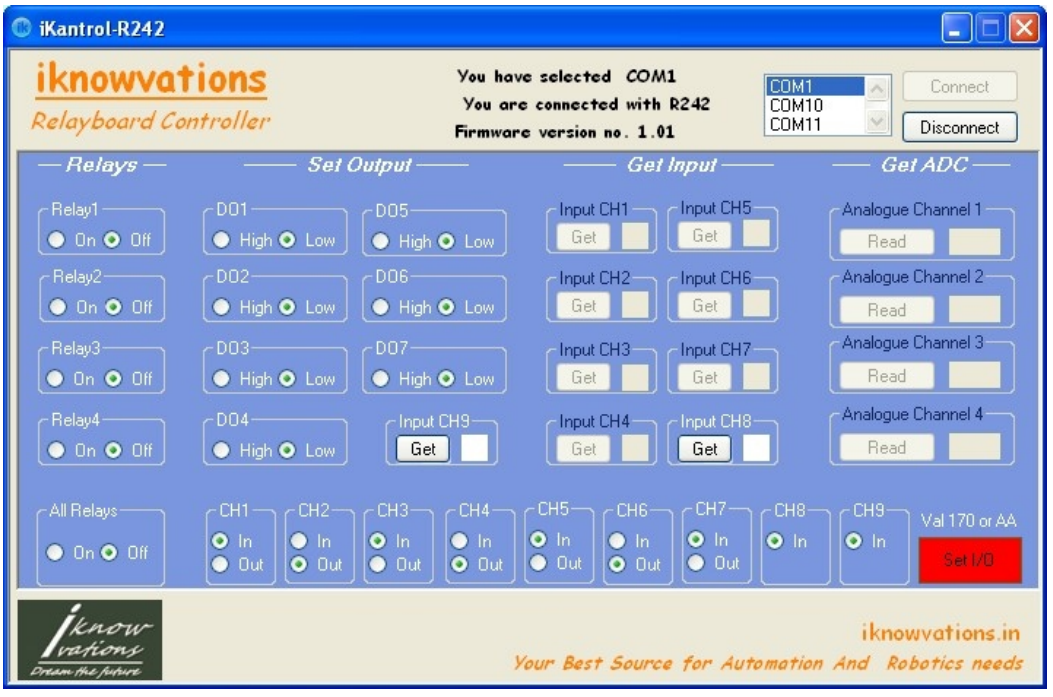
iKantrol-R242 Error Detected in Connection !
No iknovations Relay Board Found ! Please check Your Board or Serial Cable !
OK

Check the cable & power then connect again.

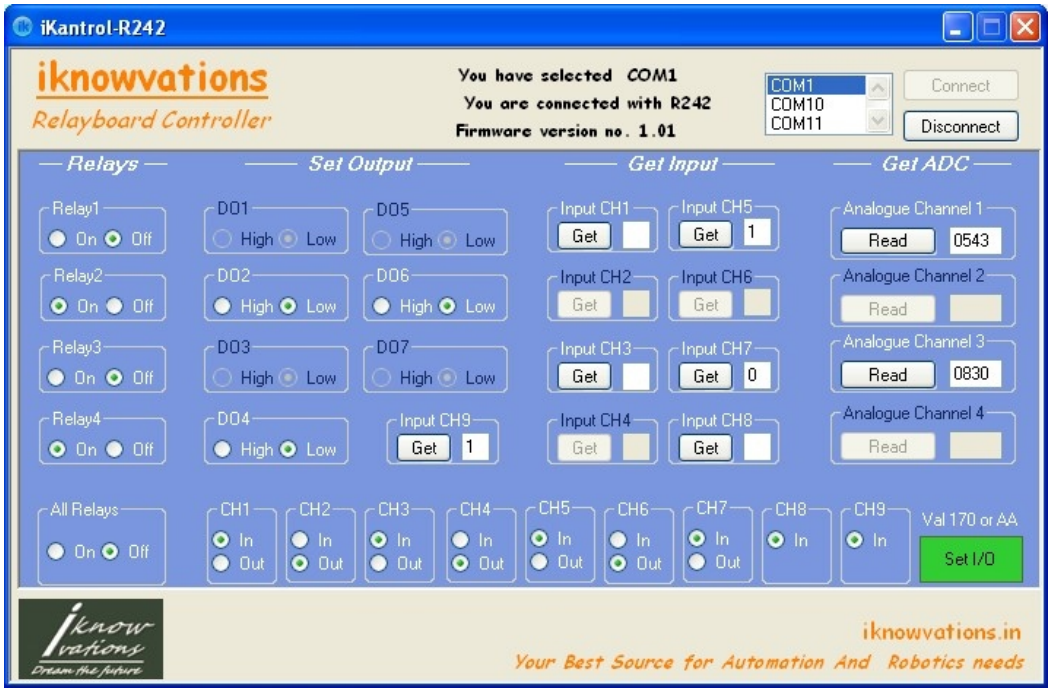
If the card is connected, you will have following screen.



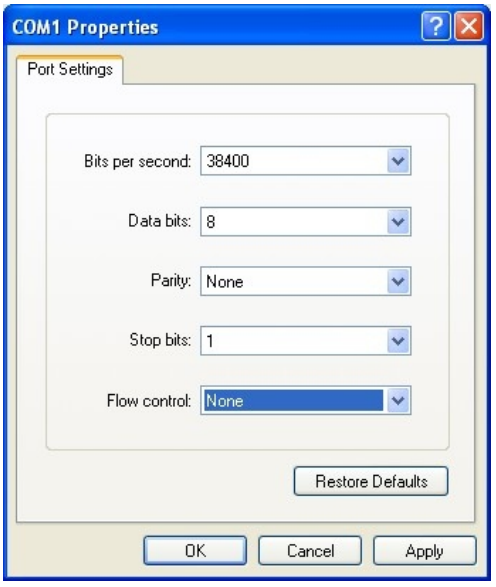
If you change any setting of Channels the Set I/O button color will change to red from green. To make change click the Set I/O button. It will turn into green again after setting the latest value, which is also shown above the button both in Decimal & Hex form.
Please not that all the buttons will be enabled or disabled as per I/O channel setting.



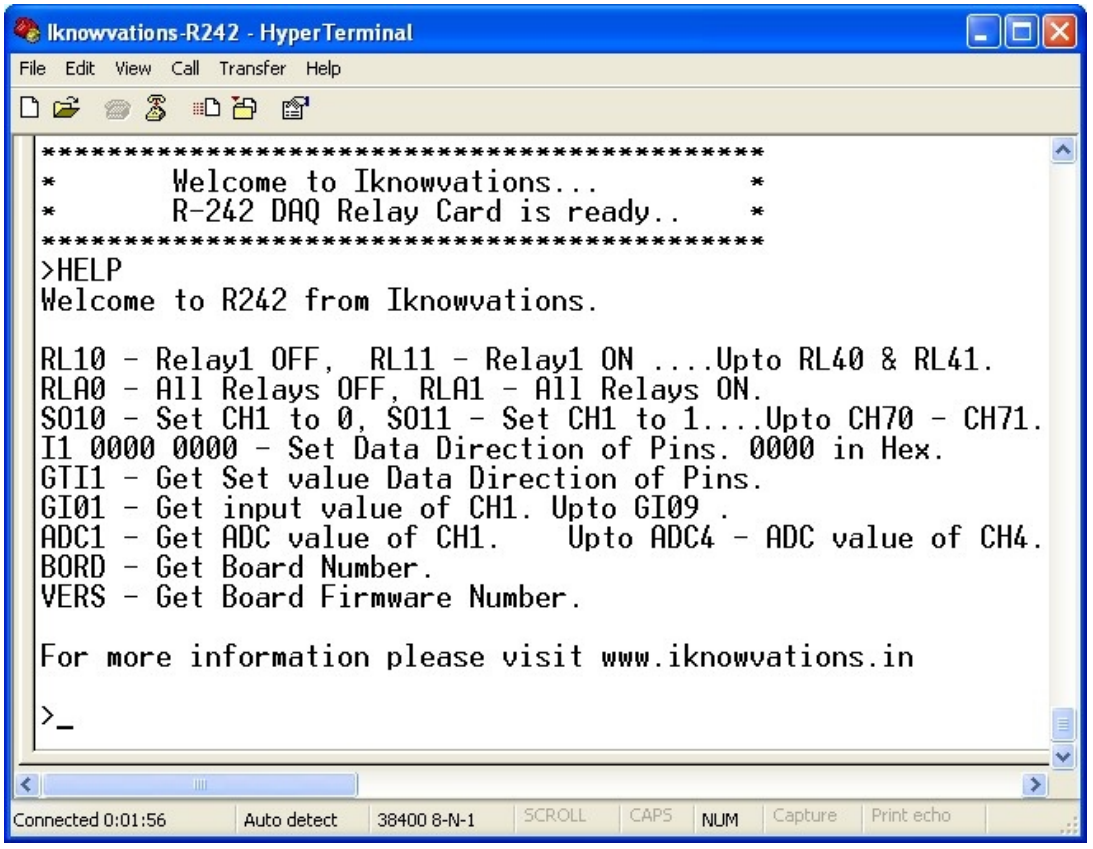
Here is a screen shot showing raw value of ADC channel 1 & 3. Also note that buttons of ADC channel 2 & 4 are disabled as the respective channels are set as Outputs.



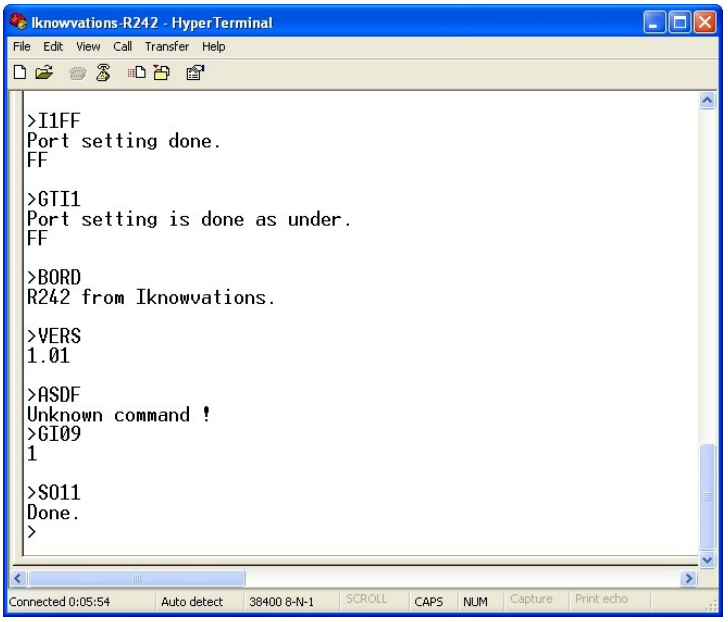
If you want to communicate with the card via HyperTerminal then start the HyperTerminal & set the com values as per following screen shot.



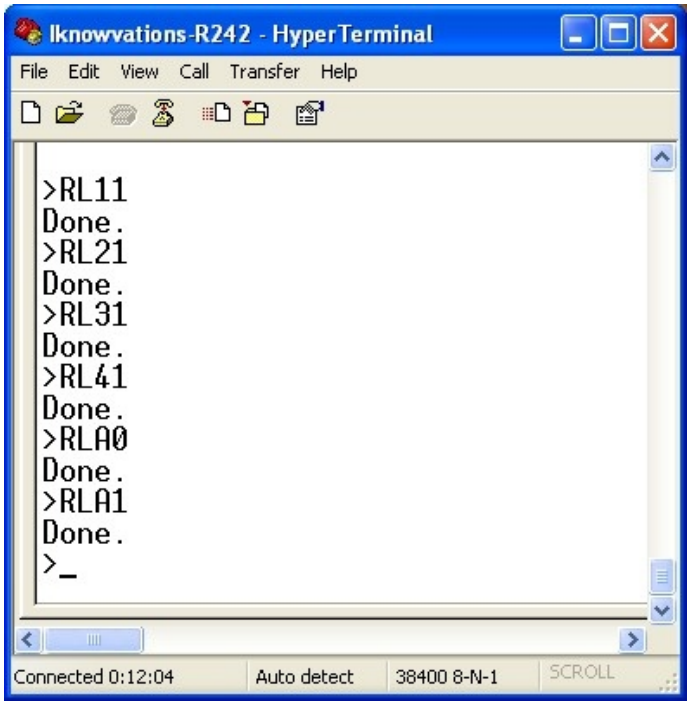
Select the com port as per your connection to the card.
Apply the power to the card. You will be greeted with the welcome message and the prompt ">".

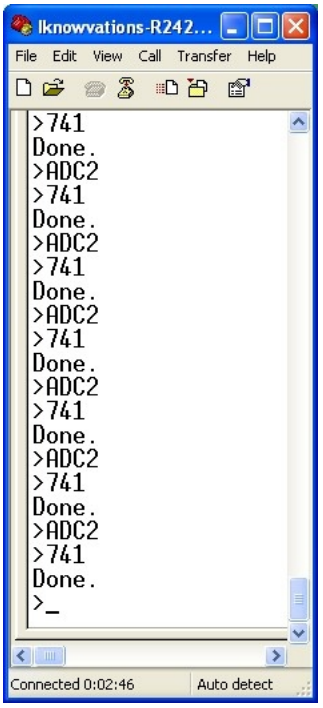

Iknowvations-R242 - HyperTerminal
File Edit View Call Transfer Help
****
* Welcome to Iknowvations... *
* R-242 DAQ Relay Card is ready.. *
****
>HELP
Welcome to R242 from Iknowvations.
RL10 - Relay1 OFF, RL11 - Relay1 ON ....Upto RL40 & RL41.
RLA0 - All Relays OFF, RLA1 - All Relays ON.
SO10 - Set CH1 to 0, SO11 - Set CH1 to 1....Upto CH70 - CH71.
I1 0000 0000 - Set Data Direction of Pins. 0000 in Hex.
GTI1 - Get Set value Data Direction of Pins.
GI01 - Get input value of CH1. Upto GI09 .
ADC1 - Get ADC value of CH1. Upto ADC4 - ADC value of CH4.
BORD - Get Board Number.
VERS - Get Board Firmware Number.
For more information please visit www.iknowvations.in
>_
Connected 0:01:56
Auto detect
38400 8-N-1
SCROLL
CAPS
NUM
Capture
Print echo

Type HELP and press Enter. This is the way to enter any command. Please note that all the commands are entered in CAPs followed by Enter button. HELP command shows all the available commands & short along with their short description.



Screen shot showing various other commands.

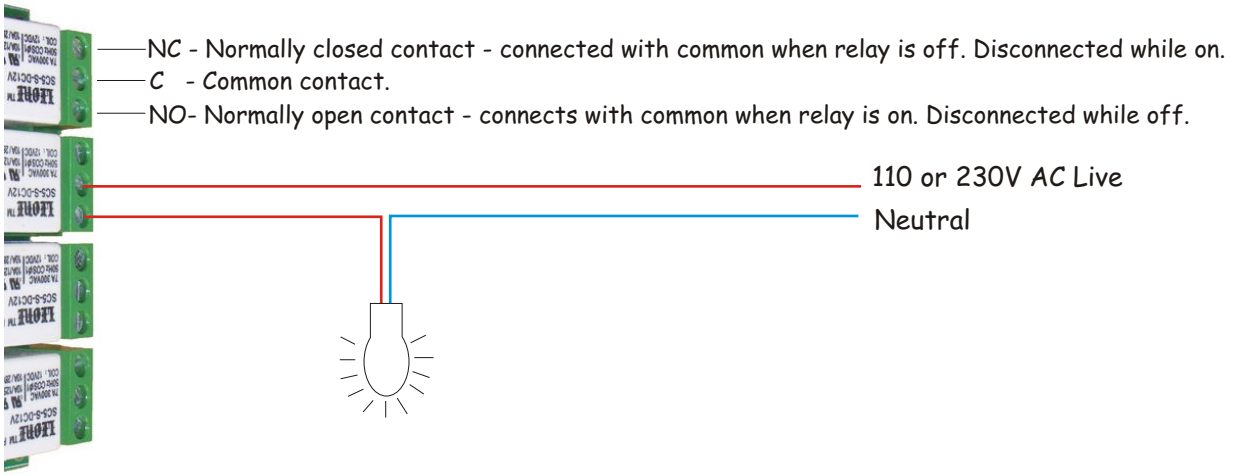




Screen Shots showing Relay commands & ADC channel commands.

Using Relay Outputs -

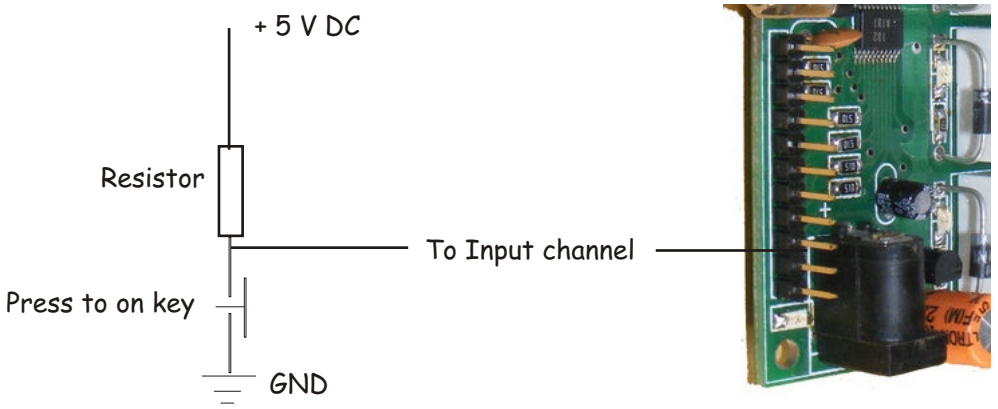
Relay outputs can be used to operate various electrical devices under software control. Extreme care should be taken if you are using 110 or 230 V AC. Iknowvations will not be responsible for any kind of damage or loss whatsoever to life or property. It will be totally user's responsibility.


NC - Normally closed contact - connected with common when relay is off. Disconnected while on.
C - Common contact.
NO- Normally open contact - connects with common when relay is on. Disconnected while off.
110 or 230V AC Live
Neutral

Use of RC Snubber Circuit across relay contacts is recommended to avoid electrical interference.

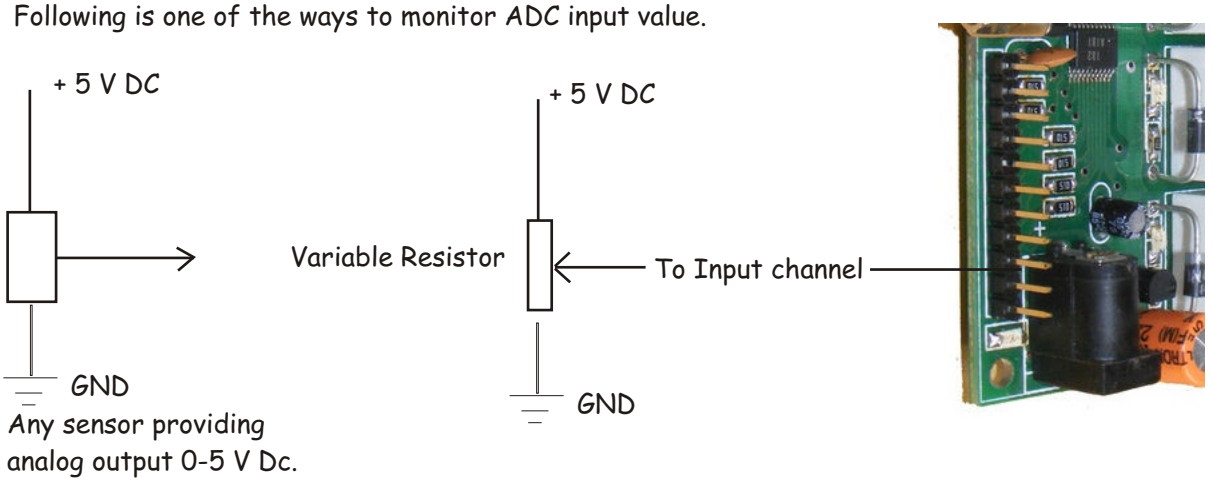
Using Input channels -

Input channels can be used to monitor input conditions of any signal that toggles between 0 and 1, that is between High & Low. Following is one of the ways to monitor input value - Key inputs.



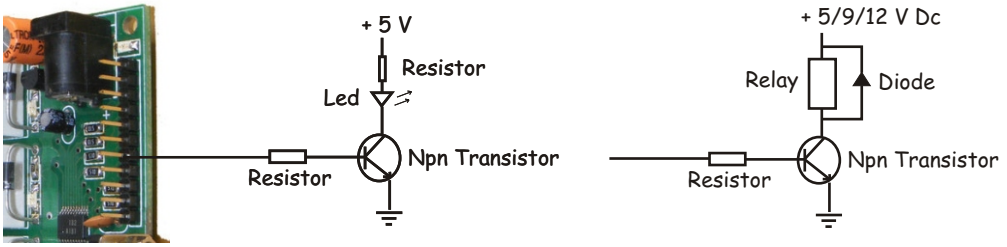
Using ADC channels -

ADC channels can be used to monitor input voltages of any signal that varries between 0 and 5V Dc. Following is one of the ways to monitor ADC input value.



Using Output channels -

Output channels can be toggled between 1 & 0, that is bet High & Low. This signal can be used to switch on & off through use of transistor shown as under -



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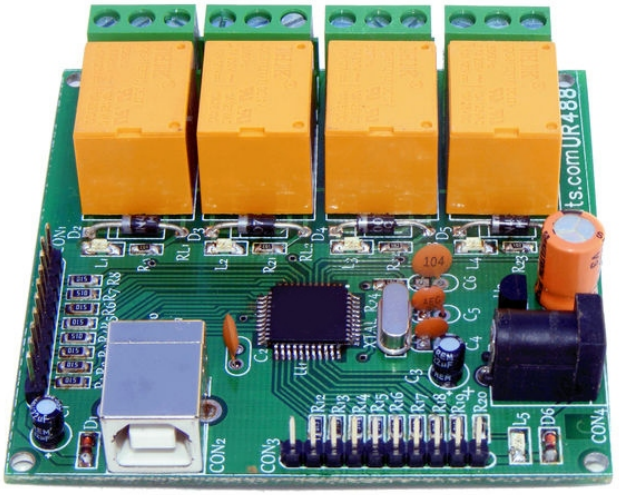
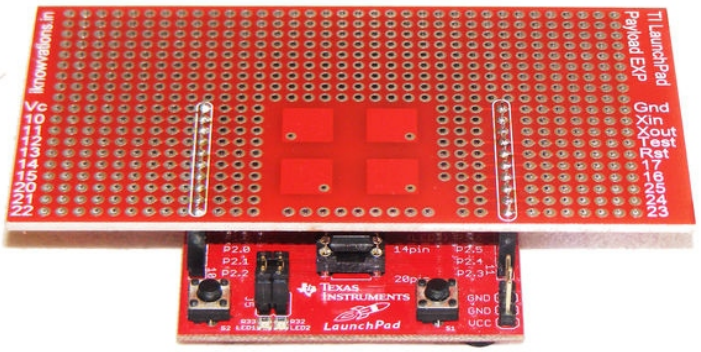
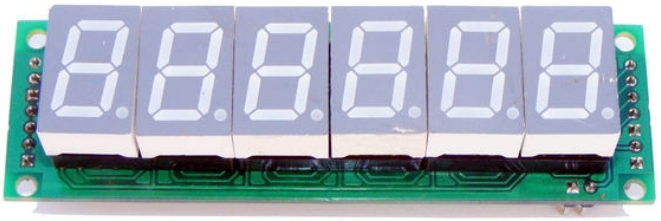


Just like R242, U452 is an USB based Relay Card having up to 16 I/O channels & 8 ADC channels. The ADC resolution is 8/10/12 bits user selectable.

Experimental Board for TI LaunchPad.





6 digit 7 segment Multipurpose LED Counter

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